UNIX™/Linux Overview

Unix/IP Preparation Course
June 9, 2013
Lusaka, Zambia

UNIX / Linux and Windows

Why does AfNOG use UNIX / Linux?

- It's what the Internet uses to provide core services
  - 55-60% of all web servers are running Apache
- Much of Enterprise class computing built around UNIX / Linux
- Open Source network monitoring and management solutions
  - Widely used
  - Generally not available for Windows
- Router OSes are command-line and some, even, Linux

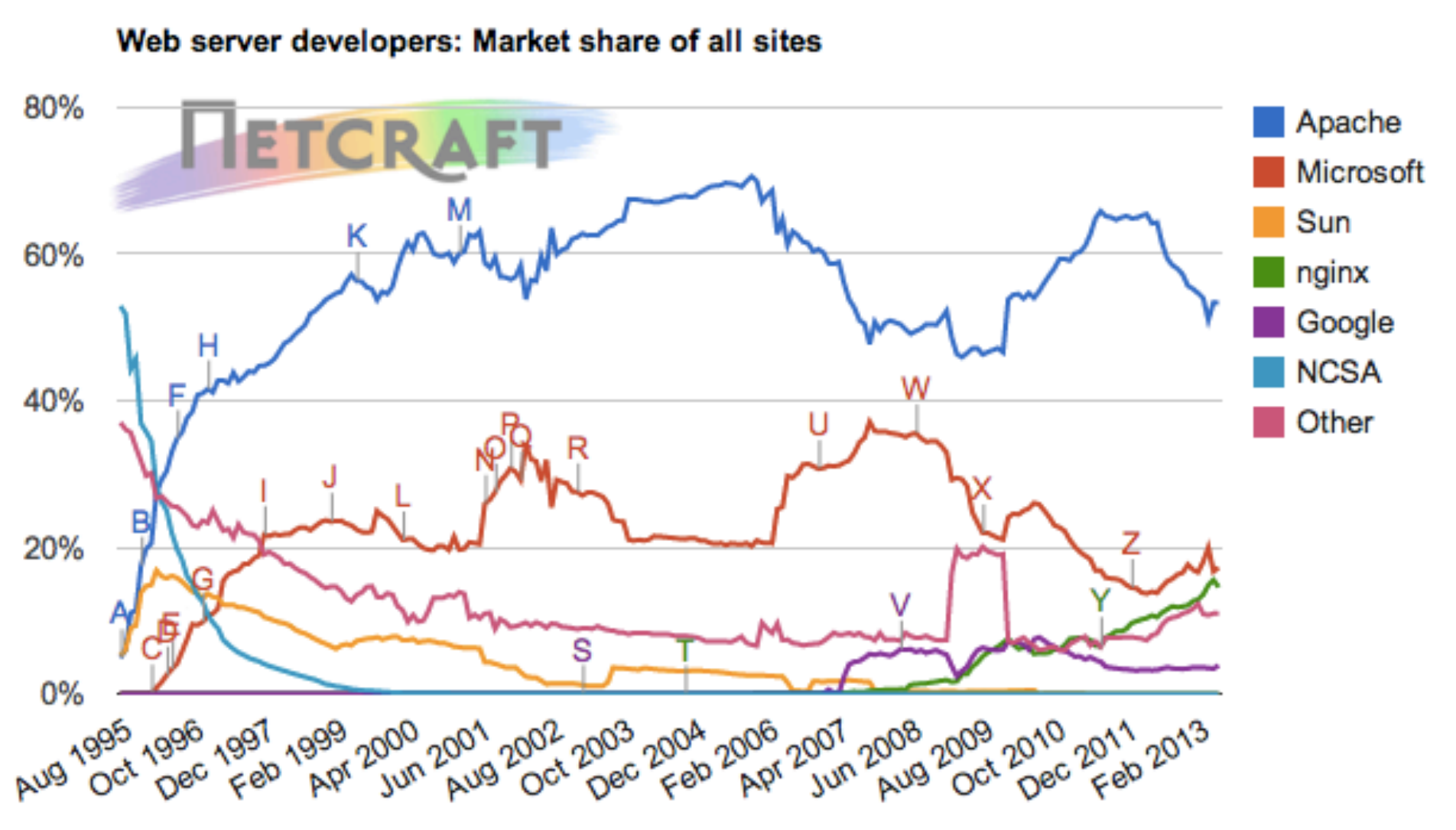
We assume

- End users are on Windows (some places Macs, too)
- Don't expect end-users to use UNIX or Linux
- We do expect that you are likely to use Linux or UNIX

Licensing

- Windows products cost $$
- Open Source software is "free" (as in beer)
- Actual costs to implement vary widely

Web Server Usage



Courtesy Netcraft (http://news.netcraft.com/), June 2013

Unix and Linux

Are they the same?

- Yes, at least in terms of operating system interfaces
- Linux was developed independently from Unix
- Unix is much older (1969 vs. 1991)

Scalability and reliability

- Both scale very well and work well under heavy load (this is an understatement )

Flexibility

- Both emphasize small, interchangeable components

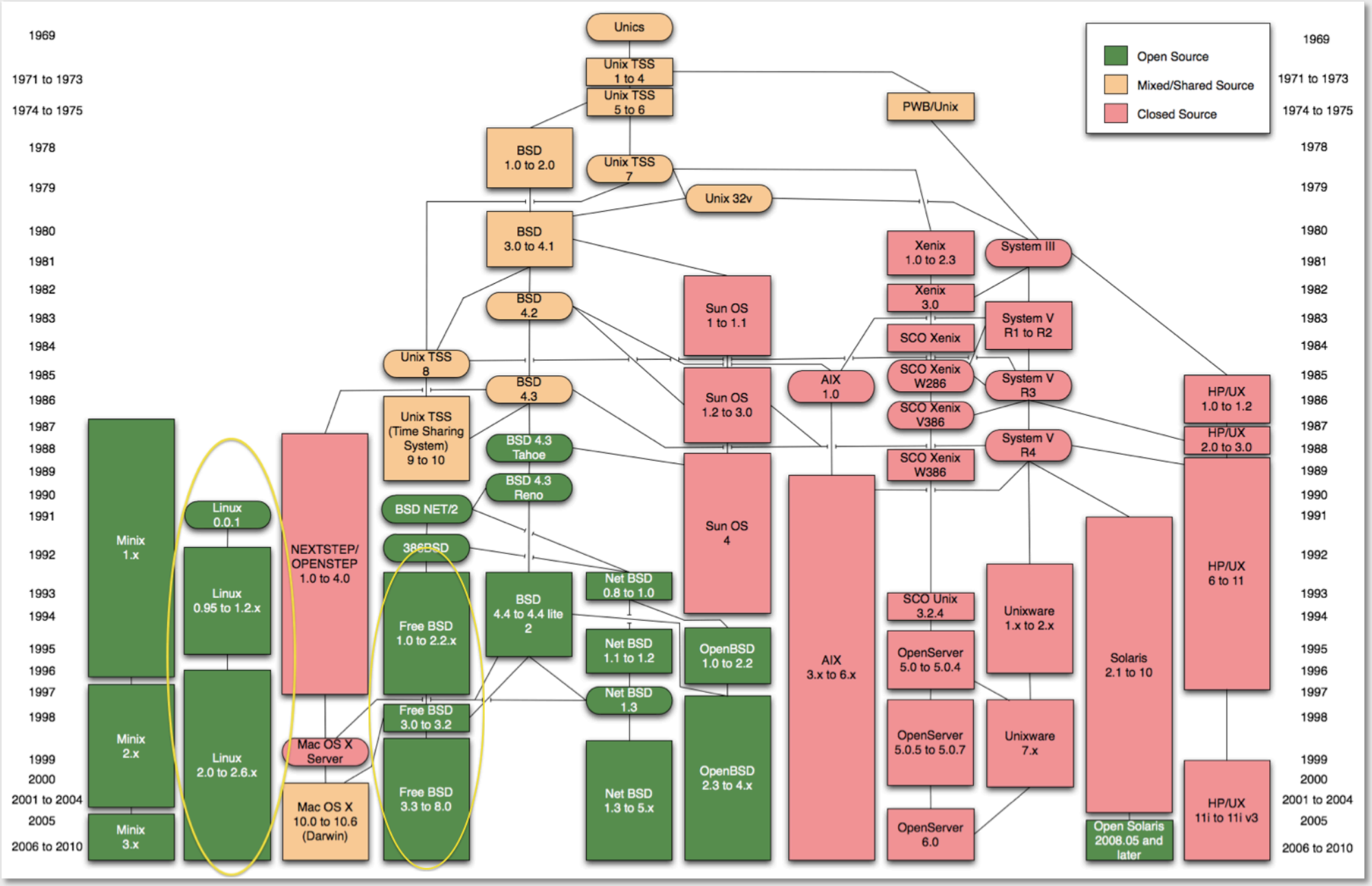
Manageability

- Remote logins rather than GUI
- Scripting is integral

Security

- Due to modular design has a reasonable security model
- Linux and its applications are not without blame

UNIX/Linux History



FreeBSD Timeline

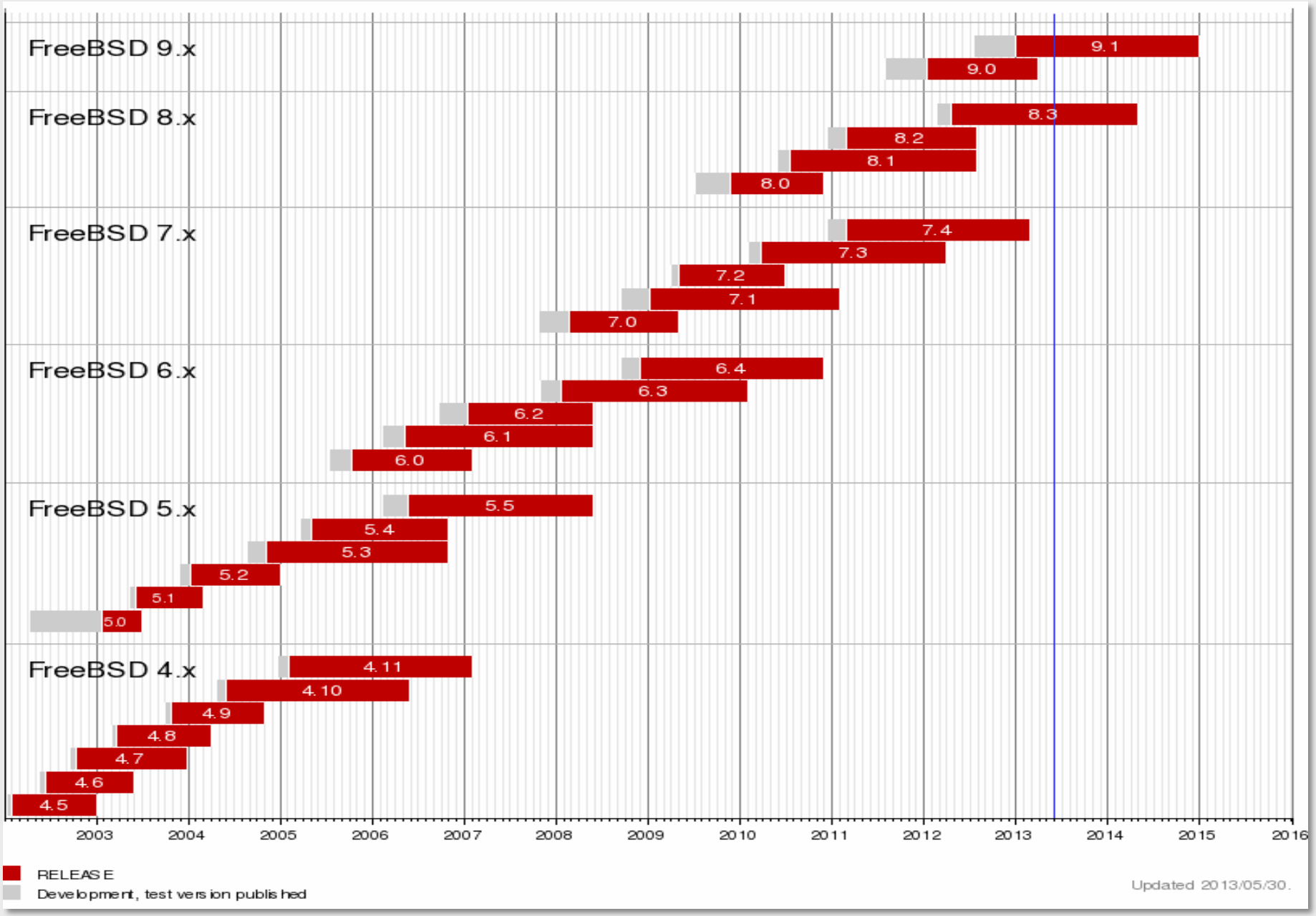


Image courtesy of Wikipedia

Ubuntu Timeline

Version	Code name	Release date	Supported until	
			Desktop	Server
4.10	Warty Warthog	2004-10-20	2006-04-30	
5.04	Hoary Hedgehog	2005-04-08	2006-10-31	
5.10	Breezy Badger	2005-10-13	2007-04-13	
6.06 LTS	Dapper Drake	2006-06-01	2009-07-14	2011-06-01
6.10	Edgy Eft	2006-10-26	2008-04-25	
7.04	Feisty Fawn	2007-04-19	2008-10-19	
7.10	Gutsy Gibbon	2007-10-18	2009-04-18	
8.04 LTS	Hardy Heron	2008-04-24	2011-05-12	2013-05-09
8.10	Intrepid Ibex	2008-10-30	2010-04-30	
9.04	Jaunty Jackalope	2009-04-23	2010-10-23	
9.10	Karmic Koala	2009-10-29	2011-04-30	
10.04 LTS	Lucid Lynx	2010-04-29	2013-05-09	2015-04
10.10	Maverick Meerkat	2010-10-10	2012-04-10	
11.04	Natty Narwhal	2011-04-28	2012-10-28	
11.10	Oneiric Ocelot	2011-10-13	2013-05-09	
12.04 LTS	Precise Pangolin	2012-04-26	2017-04	
12.10	Quantal Quetzal	2012-10-18	2014-04	
13.04	Raring Ringtail	2013-04-25	**2014-01**[28]	
13.10	Saucy Salamander	2013-10-17[67]	2014-07	

Old version | Older version, still supported | **Latest version** | Future release

Image courtesy of Wikipedia

Shells

Command line interface for executing programs

- Windows equivalent: command.com or command.exe

Also programming languages for scripting

- DOS/Windows equivalent: batch files, WSF, VBScript
- Linux/Unix: Perl, shell, php, python, C, etc.

Choice of similar but slightly different shells

- **bash:** the "Bourne-Again Shell". Combines POSIX standard with command history.
- **sh:** the "Bourne Shell". Standardised in POSIX
- Others: **ksh**, **tcsh**, **zsh, csh**

User processes

The programs that you choose to run

Frequently-used programs tend to have short cryptic names (why?)

"**`ls`**" = list files
"**`cp`**" = copy file
"**`rm`**" = remove (delete) file

Lots of stuff included in most base systems

- Editors, compilers, system admin tools

Lots more stuff available to install as well

- Thousands and thousands of packages

Services, Processes Daemons

Programs that run in the background; called daemons on FreeBSD➔

"sparky"

Examples:

apache:	The Apache Web server
cron:	Executes programs at certain times of day
syslogd:	Takes log messages and writes them to files
sshd:	Accepts incoming logins
sendmail	(other MTA daemons like Exim, Postifx): accepts incoming mail (smtp)

Any questions?

?

Software Installation FreeBSD

Software management in FreeBSD

- Install from source
- Install from binary
- Compile from source using a port
- **Use a wrapper tool, such as *portinstall*.**
- **Install pre-built FreeBSD packages using *pkg_**
- **Some people using *pkng* (next gen)**

You can keep the source tree local and up-to-date. This is known as the *ports collections*. A number of tools to do this, including *portsnap.*

Software Installation Linux

Two major packaging systems:

- Redhat Package Manager ➔ RPM
- Debian Packages ➔ DPKG

Both have wrapper tools to make them easier to use:

- rpm wrapped with **“yum”**
- dpkg wrapped with **“apt” and “aptitude”**

Both use repositories.

Linux has the other usual suspects as well:

- Install from source
- Install from binary

System Startup FreeBSD

Startup scripts in FreeBSD

- `/etc/rc.d` – system startup scripts
- `/usr/local/etc/rc.d` – third-party startup scripts

Controlling services

- In `/etc/defaults/rc.conf` – initial defaults
- `/etc/rc.conf` – override settings here

System Startup Linux

Startup scripts

In /etc/init.d/ (System V)
In /etc/init/ (Ubuntu 12.04 LTS and Upstart)

NOTE! Upon install services run!

Controlling services

Stop/Start/Restart/Reload/Status Services

```
# service <Service> <Action>
```

or, “old school”

```
# /etc/init.d/<service> <action>
```

Administration

- The use of the *root* account is discouraged. The *`sudo`* program is used instead.
- You can do *a "buildworld"* to move between major and minor releases (FreeBSD).
- You can use *apt* and/or *yum* to move between many major and minor Linux releases.
- Ubuntu does `do-release-upgrade` to move to a new version.

There's More

The FreeBSD Handbook

http://www.freebsd.org/handbook/

FreeBSD Resources

http://www.freebsd.org
http://forums.freebsd.org
http://www.freshports.org/
http://wiki.freebsd.org
http://en.wikipedia.org/wiki/FreeBSD

Ubuntu Resources

http://www.ubuntu.com
http://ubuntuforums.org
http://www.debian.org
http://ubuntuguide.org
http://en.wikipedia.org/wiki/Debian
http://en.wikipedia.org/wiki/Ubuntu_(Linux_distribution)

Connect to your Virtual Linux Machine

Now you will use ssh to log in on your virtual Linux machine:

1. Windows users download putty.exe from:

   http://noc.ws.nsrc.org/downloads

2. Save putty.exe to your desktop and double-click the icon
3. Connect to pcN.ws.nsrc.org as user "*sysadm*"
   We'll do this now and instructors will help

Mac / Linux users open a terminal window and do

```
$ ssh sysadm@pcN.ws.nsrc.org
```

Password for *sysadm* user will be given in class